

# Hermann Boerhaave's (1) *Atrocis, nec Descripti Prius, Morbi Historia* (2)

The First Translation of the Classic Case Report of Rupture of the Esophagus, with Annotations

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## HISTORY OF A GRIEVOUS DISEASE NOT PREVIOUSLY DESCRIBED

MANY and varied are the diseases which afflict humans; we have descriptions of these from ancient times. But these accurate and antique studies have not been able to exhaust the diversities of maladies. It is the case that these always occur anew; in diagnosing them it may happen that the Doctor lacks that keen judgment which would furnish him with a correct understanding of the facts at issue. Unsure of a hidden cause and uncertain of the affected area, he who had achieved success in other diagnoses and cures may now be baffled. In vain would you in your eagerness seek among the writings of the Authors anything to be of aid in your uncertainty; at times there is to be found nothing similar which has been studied or described. What Doctor is there, who while he treats a disease unknown to him, might be at ease until he had clearly perceived the nature of this disease and its hidden causes? A disease which is new and obscure to you, Doctor, will be known only after death; and even then not without an autopsy will you examine it with exacting pains. But rare are those among the extremely busy Clinicians who are willing or capable of doing this correctly. If such Doctors be fit and willing, access is difficult even if they are skilled and eager. Necessarily, therefore, are those who treated cases of old of help to posterity; but there is for them that same defect of knowledge which beset those before them, especially since there are many such observations written by Skilled Men in the profession which are often left among abandoned papers and which daily are destroyed and forgotten. To offset all these inconveniences of the profession there remains the necessity of writing all singularity of disease and indeed of each disease observable. For such a task it is required that the case history be so clear that when it is read the Reader will immediately see the evident correspondence, so that he will learn of the present disease from that previously described. Everything pertaining to the



REDRAWN FROM STEEL ENGRAVING

HERMANN BOERHAAVE

ATROCIS,  
NEC DESCRIPTI PRIUS,  
MORBI  
HISTORIA.  
SECUNDUM MEDICAE  
ARTIS LEGES CONSCRIPTA

A B

*Ant. D. Kane*  
*1793*

HERMANNO BOERHAAVE



LUGDUNI BATAVORUM,  
EX OFFICINA BOUTESTENIANA:  
MDCCXXIV.

case must be listed; nor that least thing neglected which a critical Reader might rightly seek to understand the malady. Narration must be done carefully so that the order of events be unchanged; there must be arrangement according to the surging change of events, and each event must be recorded in its proper place.

The reasons given above force me to make my contribution to the common good of the profession; especially by describing the most atrocious malady whose vehement violence hastened the death of the great hero, that famous and noble man, Baron John van Wassenauer (3) of the Dynasty of Rosenberg, Grand Admiral of the country, and Prefect of the Rhenish Roads (4). The entire nature of the disease was so extraordinary, the attacks so violent, and the suffering so abominable that you would scarcely find, among all the Medical Writers, any similar case. Would that the description of this malady might be able to cure those whose fatal and swift death is hastened by this disease! But I confess sadly that I expect no such great or notable event from my writing. But I do know that Doctors will certainly be able to recognize the disease when it occurs again. A good Doctor can foresee the fatal outcome of an incurable illness: when he cannot help, the experienced Doctor will take care not to aggravate the sick person's malady by tiring but injurious efforts; and in an impossible case he will not frustrate himself further with ineffective solicitude. A history and description of the present malady in my opinion will benefit the Profession. In this same writing will be contained an account of what was done and by whom it was done. Because it concerns a distinguished person who was born before the very eyes and in the hearts of the entire country, no Doctor desires to endanger his reputation; yet he is desirous of giving some information on the case: how this grievous disease rebuffed the aid of medical inadequacy. There are depraved, insincere, and tenacious men who derive pleasure from uncertain and suspicious tales spread among the populace, and then exaggerate them. Corrupt judges examine the truth incorrectly. Under no pretext could they reject these things if they were proved true. If I reap the rewards of my labors I will rest content with my prize.

Naturally handsome and tall, already from his boyhood had he strengthened his body in almost all kinds of exercise; as a result he enjoyed continual perfect health. Neither did excess of luxury or sloth ever weaken his health or natural strength of body. Born in his country and always a prince among men he could not, however, always demand life within the bounds set by nature, nor could he invariably observe the exacting niceties of moderation. For who can always live with leaders, complying with their desires and dedicating his life to friends, without violating any of these precepts? No one unless he would wish to be considered a strict follower of some melancholy sect. But as long as he lived he was prudent and never went to any excess; he was always careful in giving himself over to assiduous exercises of body and mind. Wherefore he

enjoyed a laudable temperament of the humors and never suffered a serious illness. Many years ago he fractured his shin, and after suffering much pain from this he had a weak leg; otherwise he was healthy, except that he often had quinsy in his youth. A long time ago during his winter duty gout seized his joints. It was violent, persistent, and did not ordinarily recede without a peculiar surviving weakness in the joints. He wisely and patiently endeavored to make light of this and with remarkable self-control did not try to irritate this with suggestions offered which were generally harmful, but with warm applications and rest he wisely strove to lessen and diminish it. The cause of this painful malady was meanwhile investigated. And it was with keen and penetrating cleverness, which he often employed, in examining cases he concluded that his malady was due to rich food, a liberal use of wine, and a lack of exercise: I remember hearing him say this often. And this opinion is not only an appearance of truth! He perceived clearly that the mouth of his stomach was always irritated by these things and he was accustomed to complain of this occasionally. And he was of the opinion that nothing was safer or more certain than to vomit; and he was accustomed to cleanse the stomach gently at once if that part lay at fault. He employed the curing power of that American root *Ipecacuanha Pisoni* (5) which was prepared by copious infusion of *Carduus* (6).

Before midnight on October 29 the noble and wise Baron James van Wasenaer, Consul of the Republic of Leyden, came to my house asking in very woeful and disturbed spirits if I would go to his brother John. He was hysterical! With profuse tears he told me the matter in response to my questions: John was lying at Rosenberg near death; or, according to this woeful and excited soul, already dead. Arriving there by fast mounts we immediately found the famous man sitting erect upon his bed, his body bent forwards, thus compressing his abdomen and diaphragm into the thorax by this position. As this posture was uncomfortable to the sick man he had to rest upon and be assisted attentively by three servants who supported him. Every other bodily position increased the pain so enormously that it would become unbearable especially if he tried to straighten up. He could not lie supine or prone, nor could he bend backward or forward, and even less could he sit erect. I was struck with consternation at the spectacle. I remember how I often admired him bearing sharp pains with heroic fortitude: when almost tortured to death by the sufferings of these pains, in silence and restraint, he endured the pains of gout composedly. The vehemence of the pain was evident, but more so the patience, whenever unavoidable groans were heard which the intensity of suffering forced upon the sufferer who strove and attempted to repress them. There was one thing that gave me hope and quickened me; I saw present there the noble man and famous doctor, James de Bye, whose knowledge and ability in medicine was praised the country over. The best hope in the case was in him. As I approached and greeted the patient he tried to raise himself a bit, offered his hand and returned

greeting as politely as possible; yet he seemed hardly able to do this on account of increased pain at every movement and every word. He then tried to tell me of the malady he was suffering, but could not; when he intended to talk the pain prevented him. Would that he could tell of this; "Think, Boerhaave, what sufferings have tried my patience; you know what pains I suffered! Think what this is whose immensity forces groans from me which I cannot suppress." It seemed impossible for a man to be capable of such suffering. It is hard to see and hear these things. It would have been cruel had we exacerbated the malady by seeking its cause. Rather it seemed better to inquire of the history of the malady from the most learned Master Francken. He lived in the house, and taught knowledge, learning, and virtue to the Grand Admiral's only son. He was present during the entire illness, paid careful attention, and rendered all sorts of assistance. When asked he told us the entire case while the sick man listened and confirmed everything he said:

Having feasted richly with friends three days before his illness, he had corrected the excess by a rather severe diet. At the last meal on the day he took sick he ate veal soup with fragrant herbs; he took a little white cabbage boiled with sheep; spinach; and calf sweetbreads lightly roasted (or fried); a little duck, the thigh and breast; two larks; a bit of apple compote and bread; and ended his meal with dessert consisting of pears, grapes, and sweetmeats. With his meal he drank a little beer, and a little wine from Moselle. Then during the entire afternoon he abstained from eating between meals and from drinking. He went horseback riding with the most noble Baron, his Son, was happy, well, felt nothing, and suspected no illness.

When this was over and he returned he did not eat as was his custom. In the evening he drank three cups (which the Belgians call *Spoelkommen*) (7) of tepid water in which was mixed *Carduus Benedictus*. When asked why he did this, he said that something irritated the opening to his stomach and that he wanted to get rid of it: since he would complain at times of a pain in that region he could always relieve himself of it by vomiting. Shortly afterwards he vomited but only a very little and this not easily. So he took four more glasses of bitter *Carduus*. Even with so much he vomited but little. Surprised at this delay he ordered some more, thinking that by taking more he would be relieved more quickly. But while he was sitting on a chair trying to vomit even though he did not feel any illness thus far, he suddenly gave forth a horrifying cry at which all the servants ran and they heard him complaining that something near the upper part of his stomach was ruptured, torn, or dislocated. He added that he felt a sharp pain to such an extent that he thought in the most certain and vivid manner that death was coming and inevitable. All those present encouraged him to better hopes: but he said his life would last for just a few moments, because there was so much internal pain that no medical or natural help could avail. He could not describe what happened or the sufferings

that were paining the upper orifice of his stomach, or what was paining him internally. They urged him to summon medical help immediately and all there earnestly entreated him to give them permission to do this. He said it would be of no use, as even if they hastened he could not prolong his life long enough so that they would return and find him breathing. It was impossible to fight this malady and not even the best attention of medicine could help. There was but one thing left for which their hopes and help would be beneficial and he asked this alone: that they would stand him on his knees as soon as possible so that as a suppliant and humble man he could honor God, surrender himself in his illness to Him, and ask His saving help. The pains were so increasing that even these brief words were interrupted. His attendants quickly obeyed him and while he was yet praying his body was shaken with pain and he was immediately placed on his bed. Cold sweat formed, grave fear seized his words and hands, and then the movements of his pulse began to weaken. At this he asked that his body be warmed by woolen blankets heated at the hearth and they moistened his head and chest with the juice of crushed herbs, the odor of which had healing effects, and they put more of this on his precordium. After these things were faithfully and carefully attended to at the bed of the sick man, his unknown malady resisted cure. On the contrary, it became all the more violent and hastened death. Since the stormy night and the distance from which medical help had to be summoned made those present destitute of help and advice, after a half hour he drank four ounces of olive oil and irritating his palate with his finger, he vomited something along with the *Carduus* water; again he asked for two ounces of olive oil, drank it, but it had no results, not even to make him nauseated, though the pain was meanwhile growing worse. It was a half hour later he drank about six ounces of good medicated Danzig beer which is commonly called *Joopenbier* (8), which was first heated. He kept this down without nausea so that he retained all else he took after that. Such was the state of affairs and the stand of events when the celebrated Doctor de Bye, who was summoned from the Hague, first arrived, who, considering all things, correctly and prudently advised to act only with slight remedies; he gave the sick man soft ptisans (9) of oats to swallow, hoping for some alleviation. He prescribed this because the nerves of the sore parts had become irritated by the impetuous attacks of vomiting. He also prescribed a remedy of milk and corn to be rubbed over his precordium very gently; all this seemed to promise certain hope of recovery; but while these were being cared for and applied from time to time but to no avail, I entered, as I mentioned before, and found everything thus.

After hearing of this most sad case and its events and considering it from all angles, we directed the utmost attention of our minds to ascertain the nature of this terrible and sudden malady lest we irritate it by prescribing remedies: since unless we knew its cause we would have no safe method of approach to it

if we would not first attend to this task. We observed the sick man, noticing each of the following: the interior of his mouth unto the fauces which was moistened with natural saliva gave signs of good health and there were only good, healthy signs in the color and condition of what we could see; no sickness; no belching, and there was no foreign odor when he breathed or offensive moisture which would displease the sense of taste; and the stomach, which was in no way repugnant and which I examined, was without difficulty in its parts; nor did the pharynx prevent deglutition; nor did it suffer impairment; there was no thirst; nor did we hear even a light complaint of trouble with the ailing stomach; gasping stopped for the remainder of the malady. The region about the hypochondrium showed no swelling or pain or no resistance or hardness to the touch; the urine was natural and easily expelled. Matter ejected by vomiting gave of itself no indication of sickness and ordinarily it did not indicate perfectly what had been eaten.

Then we found that the temperature of the entire body was neither too high nor too low but was equally distributed: except for the fact that vehemence of increased pain seemed to threaten equal distribution of the bodily temperature and that coldness in the joints would increase in proportion to the irritation; there were some rather weak pulsations in the arteries but they were constant and the same and gave neither indications of rise in temperature nor the slightest signs of inflammation; respiration was found adequate, sufficiently slow, and evenly distributed; the voice was natural, pleasing, constant, without difficulty, if, when speaking, the bending and brisk movements of the diaphragm were avoided; when asked, he breathed deeply, exhaled slowly and replied to this without increase in pain, and I do not remember hearing him cough during his entire illness; and there still was luster in his eyes when he moved them and he had natural color to his face; his mental actions were never deficient or wandering; his willed movements were prompt, except insofar as increased vehemence of pains prevented these.

During our examination there occurred a pain at which there was great distress; it was an inexplainable feeling of some change in the position of the parts within his chest. When we investigated it in every way he could not describe it except by saying he clearly felt that some parts in his thorax were moved from their natural position. He described his malady in apt words; it was sharp, a real laceration of membranes which could be easily felt and it was very cruel, great, never ceasing, quieting not even for the briefest moment, and hardly ever desisting even a little from intense sharpness. Very distinctly did he indicate the region of the cause of the malady by carefully pointing out the place within his chest; he further and accurately indicated, if we were to believe him, his diaphragm was paining him. When the malady afterwards grew worse, he cried that he vividly felt that the pain and its accompanying violence was extending from the aforementioned area in his breast to involve the region around



his back and that this was hardly less savage than the other was at first. Then before he died we heard him complaining with great misery that the pains were spreading to his back through the sides of his breast and throughout every internal part; so that he was not in the least alleviated in the first place involved, while pain was continuing to spread through his side and to new regions. As many times as we asked him, he affirmed that the extent of the painful malady did not diminish in its great sharpness in any part. During the entire course of the illness he always recalled that the fire of the pain burned crueler than any other thing except for gasping for breath; the wind from the stomach could not go upwards but being suppressed it would cruelly dilacerate him; nor was there less pain whenever he tried to bend backwards or to straighten the vertebral column.

All this is what we discovered with solicitous diligence; no one can repudiate such statements made with scrupulous care: I have assiduously accounted this so that the description would include for my reader everything as it happened. There is nothing added or exaggerated in this description.

And I ask you, Professors of the Discipline, that if you read this you do not scorn it but that you seriously and dutifully uphold it. Weigh this genuine narration cautiously in all respects. Prudently trust in everything I have presented to the Reader. If I may presuppose your permission: once more I ask that from these things described you conclude the nature of the disease, the origin, progress and appearances of which you have just read. And when I ask, tell me, please, what is it that lies hidden within the chest and produces these abnormal internal effects? And in accordance with the strict laws of medical science tell me what is the part that suffers such horrible pain? Employ the sharpness of your talent to discover with your keenness things that are true and certain; but before read the following:

Let us consult the record which well shows every angle of this tragedy; with solicitous and intent care, let us go over everything which would bear on our attent thought. Let us seek a solid and safe basis on which our thought can rest and be able to conclude a cure for this overpowering malady by first discovering the hidden cause of such a great illness. But with what sorrow, how futilely do we say all this! For there is no appearance of the malady to the Searcher in dense darkness, no appearance worthy of mention we can perceive. Inflammation, the evil mother of other ills, cannot be blamed: none of its indications were manifest. Who dared to suspect that the diaphragm, the pleura, the mediastinum, the pericardium, the heart, esophagus, the intercostal muscles were affected by phlegmon? Who has this careful description of the malady before his eyes and is a prudent observer of the signs? No one, if I see any truth in these things. The inexperienced would seek this plausible and apparent cause of the malady, though this cause would not be true, and would wonder if any nervous membrane in the chest expanded by a lump of swelling would beget

these cruel symptoms if it were lacerated. But no kind of swelling occurred which would furnish all the symptoms which would be hastily observable; nor were any of these noted which could arouse suspicion except that he would suffer with acute phlegmon which was rather remote in the symptoms of the malady; dislocation or laceration was inadmissible: since the vertebrae were thought to be in their proper position; dislocation of the soft parts in the chest could beget pains of distortion but not pains of death. There remained but one thing, the cruelty of which has many times hastened life's end, a fatal quantity of a strong poison. Only that phenomenon seemed acceptable to the intellect as a sufficient cause. But though I carefully ran over all the kinds of poisonings found among the Writers I did not find any to fit these descriptions. For since the duty imposed upon me by public authority demands that I know accurately, and write a history of virulent cases, I strove, in no perfunctory way, to keep up with these tasks. Considering all, none came to my mind similar to these symptoms. Uncertainty, and vagueness of symptoms led to no conclusion. We carefully considered everything but found nothing which would genuinely open to us the true nature of this malady. Nevertheless, we believed that the accustomed gout had something to do with it. Whenever this occurred there was internal pain. We both thought that the nature of this strange malady was such as to dare confidently to find in it the origin of this sickness. For it is accompanied with indescribable pain and it causes sudden and great distress for the sufferer; with slow progress and light pain it is first enervating, then there is pain, then it impedes the actions of the adjoining parts. But there seemed to be nothing of this sort in this case: upon examination and consideration neither an inexperienced nor erroneous person could be influenced so as to conclude the origin of the malady from this.

The uncertainty gave us no light! There was no such known illness whose likeness in appearance could be reminiscent in the diagnosis of these symptoms. But one thing was certain; there was sudden pain and great pain. Medical history testifies that that pain alone which is free of inflammation can be borne for a long time without danger to life and that we need not fear death in the beginning; my candor demands that I testify to this: for in all my reading there seemed to be no good reason to fear sudden death from this. Nor am I ashamed to say it after examining these things: and the results afterwards testified that not this pain but a far different cause brought sudden death.

Though the rash person would adhere to this evil in the diagnosis, we were forced to look for good remedies to help the other pain: the seriousness of the virulent torment along with the danger to be feared from the great malady did not permit delay. With counsel and deliberation it was decided to use those remedies which curbed the threats to life in the affected areas, release whatever was under pressure and ease whatever was swollen, alleviate the pain, and provide the entire body with humors. For what is better than to ease pain

whatever be its cause? What is more healthful or safer in an otherwise strong and healthy body? Though the hope of a cure was pleasing to us but impossible, four ounces of blood were taken from the middle of the right hand to weaken the pulse of the arteries. But not in the least was the grief of the pain remitted though the equal distribution in the arteries was threatened. A large cup of wine was given for the patient's irritated nerves and the pains grew worse. Lukewarm applications of flour and milk were applied to the painful areas but they benefited none. The oft repeated remedies of soft oats of *Scorzonera* (10) and of *Sisarum* (11) which he drank helped none; on the contrary, as often as these soothing remedies were carried to the stomach they caused horrible pain. This is what we did and the remedies were to no avail; we did not go further and the pain persisted, never going away even unto the fifth hour of the morning when much pressing business forced me to depart; after we decided to let nature take its course for a while and not to press nature by frustrating and apparently harmful remedies, though they are, I believe, good in yours and my estimation, my Reader. Our endeavors were lessening the hoped-for effect; on the contrary, all hope seemed to be diminishing and gone. Meanwhile we were horrified and stupefied at the occult nature of this unique malady much more than before; so that before I left, when we questioned each other, none of us could say anything to make the latent malady manifest. The Noble Hero grieved until the eighth hour and drank of a liquid of wild poppies and *verbasum* (12), roots of *scorzonera* and *skirret*, seeds of oats and white poppies, and water which for the most part was diluted with the syrup of *Fernel* (13), made from *althea*. But he received no comfort from this. Not the least alleviation resulted. The faithful and wise care of Dr. de Bye was at hand. He continued to assist with such care until death. He observed at this time that from the persistent violence of the growing pain there was a lessening of vital actions, otherwise the patient had no further symptoms. In a letter written me at this time concerning the case a man counselled and asked me whether in a case ever growing more and more urgent the good achieved from a second blood letting was dangerous, especially when the pulsations of the arteries are increasing in frequency and strength and the site of the first blood letting has clotted over. The hoped for remission of the pain would result from a further weakening of a vital action. No one believed the sick man would prevent this: while a few hours previously his strong body enjoyed unstained health, no blood letting besides the first had weakened his strength in the least and the blood taken and not yet replaced had not increased or weakened his good humors. We decided therefore on another blood letting immediately and to first make an enema of a mild *Leyden* solution of one drachma of salt and two ounces of *Fernel's althea* syrup, by this we attempted to see if some alleviation so oft attempted in vain could be given to the persistent illness. It was also decided to continue using the mild internal remedies that he had been taking. Let no one believe we

carelessly neglected or forgot about narcotics. We prudently wondered if these would be useful in this case. But weighty reasons urged us not to use them. And above all that it is characteristic of opium to inhibit bloodletting and unconsciousness would impede vomiting and urinating. We had to treat the entire body carefully and assiduously with all its humors which had suffered for many hours; there was but little humor. We thought for sure that all of these were retained in the stomach, which was expanded due to constriction of its orifice. But we were wrong! Everything was done as decided and the clyster quickly and easily opened the bowel and removed excrement as excrement takes place usually when people are healthy; but this was not found to be helpful. Then at the ninth hour before noon, not long after the effect of the enema, the vein which was cut bled ten ounces of blood. Even this did not alleviate the pain; but worse pains came whose cruelty could not be alleviated by even the most soothing remedies. The sick man, mindful of the atrocious torments of laceration, with composure and calmness, strength of mind and not uncertain of his future, made his will, bid his last farewell to his friends and relatives, resigned himself to God, and repeated that no human help could bring comfort to this malady and he was further willing to do and to undergo anything the Doctors would suggest.

When I went to him at the third hour of the afternoon he received and greeted me in his kindly fashion and was informed how everything I tried was useless, how close was death and that it was inevitable; if there were anything in medicine not tried yet, he would ensure it; had he been hopeful he would try painful or even uncertain and doubtful remedies; he should tell his relatives of this so that they might understand that whatever was possible had been done. Since he took this very mildly I saw that death was near. But I also grieved that the diagnosis was still very obscure! He had not urinated any more for some time except a little but though he had tried hard there were not even small drops. The action of his heart and joints which was weakened and injured became deficient. The panting for breath we mentioned and which had meanwhile become interrupted gave signs of suffocation and hindrance. His extremities gave indications of the pallid image of death. His mind was good. Another clyster emptied his gut, but the pain persisted. He complained of the great effort to urinate which resulted only in a few thick and red drops which had a sharp odor; the amount of what he drank did not correspond to the amount he had expelled. He still had great difficulty in breathing. We had another meeting and in our consultation we again reviewed the whole case; we gathered from the appearances of truth that everything remained in the constricted stomach and pylorus. With great effort and exertion he tried to empty himself and to rid himself of his fatal malady by ridding himself of whatever prevented this. This was considered more efficacious and efficient than if by drinking two ounces of almond oil and seven ounces of tepid water the feather moistened by the oil would irritate the fauces; in this way it would be dangerous to alleviate

the stomach. We argued to no avail. For no hope shines through to those who do not know the hidden cause except the sole hope from the immediate clearing of the stomach. We supposed an abundance of liquids. Then considering how little had been vomited and that hardly any had come through the urine for we could not see how much had gone there if all the liquid did not remain in the stomach. Therefore it was the seat of the disease, it was largely expanded by an inhuman spasm of the pylorus and constricted by a violent convulsion of the cardia. No matter how we went about it or no matter what area we would examine, the same idea kept recurring. But we were wrong in assigning this cause and area of the malady. The swelling we noticed which was evident and always increasing in the epigastrium led us astray. When the noble patient heard us speak of this and understood our plans he was so pleased with the idea of still inducing vomiting by light remedies that he not only thought it to be the only way capable of alleviating the ill, but immediately he began the remedies. The courageous man drank oil and warm water and then with great effort irritated his palate, vomited up a little dark liquid without oil and without any relief. His strength lacked for him to do more: he was exhausted and stopped, he turned to his right side, soon shivered with cold, grew pale all over, cold sweat came all over his body; not long after this he suddenly became unconscious and at the fifth hour of the evening, he who deserved all good things died very peacefully.

Distinguished Master de Bye left with me and talking over the case we admitted we were unable to diagnose the cause of the disease much less the suddenness of the patient's death: therefore neither of us would be satisfied until we examined the corpse and found out whether the death of our Noble Patient was due to ignorance, neglect, or some other fault on our part, or a more serious cause lay hidden in his body which is humanly incurable. I begged the Most Illustrious Head of the family to permit us to perform an autopsy. The Most Noble Man kindly consented to this at my request. Twenty-four hours after death I opened the body in the presence of Dr. de Bye, Rev. Sauren, the most erudite Dr. Francken, the honorable Nicholas Stam, and the family surgeon. I will try to list the observations so that you might see them as if you had been present there:

1. Carefully looking over the entire bare body we saw that it had nothing missing and it was that of an active man, in no externals was anything injured except for the few things we have already mentioned.

2. On each side the skin was darkened by a red color, and it was turning purple as though bruised; there were also black spots here and there; it was a unique and awesome spectacle; we looked at those things by which the external intercostals became ugly and purplish. That funereal color covered that portion of the body including the chest from the middle of the sternum to the hypochondria back to the lumbar vertebrae and up to the axillae.

3. In all the region we described where this lurid color disfigured the body

there appeared many small white and distinct vesicles in the skin such as there usually are in thin skin where this comes into contact with heat.

4. When I carefully touched them with my fingers I felt a strange softness in them. So unique was it that I do not recall finding anything similar. There was a flatulent swelling which was not high but was wide. It yielded to pressure but when I lifted my hand it resumed its former position. As I was examining it with attent care, it gave forth a feeling and a sort of sound of vesicular crepitation. It corresponded perfectly in every respect to that human membrane which Ruysch (14), the expert in Anatomy, called a tunica cellulosa; as often as it was filled with air, and swelled, it seemed to crepitate lightly if it was touched softly by the fingers. This true appearance of emphysema extended throughout all parts which were seen to be involved by this lurid color without extending beyond these limits.

5. The abdomen was swollen, tense, especially at the hypochondriac and epigastric regions so that there seemed to be another swelling.

6. In the other areas there was good color, spotless, and their condition was good. It was such as is found in healthy and fecund bodies.

I admonished those present to note each of these things accurately and to entrust them to their memory: since the remarkable and unique sights baffled me and they were indications of a thousand false suspicions. When there was nothing remaining on the exterior surface of the body around the abdomen and chest that our eyes and hands did not explore we turned our attention and our eyes to see the internal condition of the body, taking care that nothing would be disturbed by our work so as to make us uncertain of the undiagnosed nature of this malady.

1. Cutting the epidermis which I effected from the extremity of the xiphoid cartilage straight to the navel, I was surprised that the wound gaped widely; its sides were tensed; the fat was rising through this space and it was abnormally swollen and elastic; the muscles and all else around the abdomen looked healthy except for the fact that they were enclosed in fat which was remarkably swollen around all the areas. This fat was abnormally resistant to the touch.

2. The peritoneum which was free of these tissues was swollen in the epigastric region so that its swelling was conspicuous, very tense, similar to a swollen bladder filled with air, and it could be seen projecting through the open wound; in the other areas the peritoneum was very tense and swollen.

3. After making a small incision of the swollen membrane of the peritoneum with the head of the knife, I made a small cut through it without injuring any of the surrounding area in the least; immediately an abundance of air rushed forth with great impetus and much hissing. This too was unique so that I thought over this and falsely suspected some rupture in the abdominal cavity through which the swallowed air made its exit. Whatever it was I advised all that they were fortunate to observe this infrequent happening.

4. Then after cutting the peritoneum in the direction of the epigastrium even though only a little, the stomach protruded vigorously and rapidly through the wound, as far as it could.

5. Then cutting the peritoneum by an intersection in the direction of the navel from the end of the chest bone to the pubis, and then to the lumbar areas; then making four incisions so as to injure nothing and to remove nothing from its position: the interior surface of the peritoneum not only looked good but all the viscera of the abdomen visible to the eyes were found very healthy without any indications of any other malady. From the signs of health there was but one exception: the intestines and stomach were greatly swollen, enlarged, and distended.

6. Examining in order the stomach, omentum, liver, intestines, and spleen, I found nothing out of the ordinary in these besides what I have just stated. In one part of the ileum, which part could hardly be seen by a man with poor sight, the intestine was very tight, while above and beneath it, it was stretched as to give the appearance of a swollen intestinal fistula which was constricted by a wide band. There was nothing abnormal in the colon. There were no signs of volvulus. The cecum was very swollen. The urinary bladder was almost empty, contracted into a small mass and appeared dry: which seemed more remarkable than all else: since the bladder had given off no water for many hours and therefore this was expected to be full of urine. The diaphragm was examined carefully and it was found to be good and inculpable in all its entirety. Nor was there any indication of disease in the mesentery. We examined the entire space of the abdominal cavity to be certain whether any humor had emptied in there and yet remained. But this had no trace of the malady: no humor was found there outside of its vessel. Therefore we detected no indication of the malady in our examination except flatus which caused swelling in the stomach and the intestines. Uncertainty persisted. Nothing was found to which we could rightly ascribe the illness or the death. The stomach, though swollen, large but otherwise innocent, attracted our attention. When I pressed upon it between my hands, I found it neither resistant or hard. When I tried to expel the swelling it was useless; it permitted itself to be pressed together but it did not allow matter to be expressed, but resuming its former appearance it also retained its size. When I raised it slightly it was felt that it contained some air but that no liquids taken remained in there. I made another small incision which gained entrance thereto, and the air within rushed out with a loud, hissing sound and with great violence. The flaccid stomach, swollen with air, subsided. It appeared to contain no more air; but there remained in it a little liquid which was of a dusky red color. There was no mixture of blood either bilious or corrupt or fetid, and there were no food particles.

The sight awed and stupefied us. We found no noteworthy sign of disease in the stomach. The swelling or red color were not indications of a more serious

malady, nor did we find even the slightest traces of inflammation. Was it that the stomach, healthy and void of all coarse matter, was reluctant to dismiss the air even at death? What reason could there be for an empty stomach into which so much liquid had gone? There was no indication of these liquors found under the pylorus, nor in the entirety of the intestines, nor in the bladder, nor in the abdominal cavity. I did not know whether I slept or was awake: since I found nothing in that place into which I was inclined to believe all things had gone. Therefore the true cause of the disease was believed to lie in the thorax and that this should be examined intently. To do this safely I replaced all the viscera of the abdomen in their positions and placed the tissues in their natural positions and sutured the natural connections with care so that the diaphragm could resume its natural form in the thorax. After this was taken care of:

1. I went to opening the chest prudently; first, I made a small incision of the common integuments of the body by directing the blade of the knife in a curved line along the costochondral junctions. Beginning here from the second rib, I directed the knife in the way I have just described to that area where the lower cartilages begin to be added to the edge of the midsternum. I could not think of a safer way so as not to disturb the position and that I might expose the interior to view. Do not be surprised that I proceeded a little more slowly in this section, I found that the same condition of swollen fat which was changed from its soft nature to resisting hardness. The wound here too amazed us by its gaping lips. I intended to observe all of this. When the knife penetrated to the pleura, just as the peritoneum before, this gave the appearance of an inflated bladder through the intercostal areas from the internal region of the thorax. This membrane was pushing by a sort of huge pressure against the cavity of the chest through the spaces between the ribs and the cartilages. But this was a remarkable thing: hardly had the tip of the knife penetrated the pleura by a small aperture when the air, with a great explosion and a long sound, gushed forth through the small incision so that the violence of its emission and the long time required for its exit showed that an abundance of air had escaped in this way. But how to explain this unusual thing? For whoever noticed that air escaped from a man's thorax which never gave any external appearance of a wound? And who yet could breathe in whom nothing other than the pleura was injured? If in physiology it is true that no air naturally remains between the parietal and pulmonary pleura, surgery teaches it could go there if admitted by a bronchus which had been injured by a disease or if it slowly penetrated the wounds of the thorax into the cavity. But it was remarkable in an intact lung which was injured by neither a chronic or acute illness and without any external violence that the entire chest cavity was inflated with air which expanded more than it could on the outside in the atmosphere! Who would have thought of this third way by which it could reach there?



2. As I am thinking this over I become befuddled by many remarkable things; using my hands and eyes I hold the sternum which was slightly raised so that the light of the candle could be seen from the other side through the transparent membrane; here there was nothing extraordinary and I could be certain that I did nothing but separate the membranes. Then I cut the cartilaginous arch from the diaphragm; so that by removing the sternum I could see the condition and position of the thoracic parts. And in the mediastinum, pericardium, and pleura there was nothing noted which could be blamed, or suspected to contribute anything to the malady, or suffer anything from it. The diaphragm in so far as it could be seen seemed free of disease. But I noticed that something had happened to the lungs which I am sure I have never seen before. Both of them on either side of the thorax were so small and so collapsed that they were found as if forcefully and extrinsically compressed to a narrow space. Their color was more pallid than ashes and was turning white. They were observed healthy as far as they lay visible to the eye. Seeing this I became disturbed since I believed that something worthwhile would be found in the lungs to explain how so much air could fill the chest cavity. The heart in the opened pericardium looked nourished and there was no disease in this abode.

3. When the first incision made an aperture into the chest there came forth from it a peculiar odor which smelled like duck flesh so that I could not help mentioning this fact; I wondered whence came this strange odor which is foreign to the thorax. If we were to open the stomach, I thought that duck flesh would be found enclosed there. Then I heard the words of Master Francken who was at the last meal with Noble Baron and who remarked that he too sensed the same odor: this was the principal food which the Baron had taken at the last meal a few hours before the malady. He had not up to this point told me anything of this. Since this was the first occasion I learned this, I have inserted it above in the story relating the bodily actions antecedent to this malady. This was the first occasion upon which I began to be persuaded that another cause of the disease must lay hidden than that with which we were already acquainted.

4. We could see rather clearly when I raised the lobes of the right lung in order that I might know whether these were injured; I detected something which in itself was remarkable and at which all present became speechless. It was that these were floating in a humor which filled the entire cavity of the thorax from the right side downwards; and raising the lung it was seen to be floating. After all this I gently lifted the lung on this side and handled this gently and carefully to prevent all danger of injury. Then in a small cotyla (15) I took from this side of the chest the fluid it contained and absorbed the remainder of it with a clean sponge and collected all the liquid in one container. I cleaned that part of the chest thoroughly, injuring nothing, and moving nothing out of place.

5. Before I dared proceed further with this, I turned to the left part of the thorax where we found the same thing which astonished us on the other side. The liquid here was extravasated and was of all kinds, colors, and odors, and in large amount. It perfectly corresponded to that in the right cavity. I carefully collected it, poured it with the other and carefully cleaned this side of the chest of any humor. It was of the same appearance as that which appeared when the stomach was cut. On both sides the color was of Danzig beer thinned with Carduus and dark red; there was a distinct odor of duck flesh; there was also present almond oil which had been drunk; the viscosity corresponding to what he had consumed, and hardly exceeded that of water, except that a little solid matter showed. After a thorough investigation, not even a small drop of blood was found in the liquid; nor any sign of pus; nor any indication of corrupt humor. The amount of matter taken from the thoracic cavity was 104 ounces computed according to Amsterdam measure (16). Finding this out we more and more began to understand the nature of the malady; there was but one more way to investigate how this humor had gotten there.

6. After cleaning the chest well I then lifted the left lung gently and gave it to the family surgeon to hold back and I looked sharply for any wound in the thorax; everything there seemed healthy until my eyes wandered upon that area which is about two inches from the diaphragm, in that part of the pleura which is on the left side of the esophagus; where I saw a wound which was large and of a black color and which appeared to be intumescent. This distinguished it from the other parts. I hesitated, moved nothing and told those present to look at the region where I believed lay the entire origin of the illness. While each one in turn keenly observed the affected area whose diameter was about three times the size of a thumb, I detected a gaping fissure whose length was one-half inch and parallel to the base of the vertebral bodies of the back and whose width appeared to be of three lines of an equal measure. I called everyone's attention to this and they looked at this each in his turn carefully and intently. Then I lightly pressed the surface of this swelling with the tip of my finger. There quickly ran from this odd and swollen area through a fissure in the left cavity of the chest humor which was very similar to that taken before from each side. We marvelled at this; this had penetrated under the swollen pleura to the thin cellular membrane and caused the swelling and black color in the wound. You can understand, my Reader, how this amazed us. Then we determined to investigate carefully the condition there further and to take special care before all else not to cause any other injury besides that which the nature of the disease itself had caused. I carefully and gently put the tip of my index finger into the gaping aperture of the pleura. I gently pushed it into the wound which admitted it very easily, I felt all the soft, swollen places above the vertebrae up to the right cavity of the thorax; this membrane swollen and full, of a thin, weak and cellulous texture had swollen from its location. I thought awhile what this could be, for I did not touch even

a part of esophagus in the entire wound. But this was a monstrous and horrible thing which was swollen! When I gently turned the tip of my finger in the wound, it came upon a hiatus; it reached upon a rupture in the esophagus and easily and entirely entered a hinging cavity; from the outside, I thought it was in the esophagus. I hardly believed what I found, and in my amazement I called the others, showed them this strange and odd thing. After I took my finger out everyone examined it and then again putting my right index finger through the wound with some carefulness, I found an entrance into the cavity of the stomach below. But a part of the ruptured esophagus near the diaphragm slipped under just as I have described what happened in the upper part. In my examination in which my finger diligently searched, there was no other injury to the parts injured by the malady; at a distance of three thumbs above the wound I found, I made an incision on the left side of the esophagus so as to penetrate only the cavity so that the spectators could see wherever my finger went through this wound it would always come out above; instantly the tip of my finger came through the fissure the disease had weakened by its force.

There, my dear Reader, is the most sad account of the fearful ailment: I have described it as it happened and have spared no pains for the truth; believe me, nothing was added beyond what my eyes clearly saw, nothing else necessary to understand the case. Religion, reverence, and piety prevented further scrutiny and laceration of the corpse. But if you can find anything from this for speculation, you can do much for the understanding of human nature and point out the suffering and weakness of our bodies from the example of this terrible disease. I think it is my duty to collect for studious Men of Medicine observations, and to do this in plain corollaries lest my words be boring to you. I am sure my narration must have bored you.

1. Nothing eaten at the last meal caused the malady: since nothing was taken which would be harmful; it could have hardly been injurious. Everything seemed to have been digested no matter if it was in the stomach or caught on either side of the thorax. The interior membrane of the vertebrae was not inflamed, eaten into, or lacerated; on the contrary everything was entire except that they were greatly swollen.

2. There was no poison to eat away the parts or to cause the deadly spasm; nor was any drunk. At first glance though the anomalous, heteroclite, and sudden symptoms pressed us to examine everything closely, we found nothing suspect. But we examined everything sharply and carefully, since in the unique malady anything and everything could be suspect. In the interior membrane of the stomach, as I have pointed out, there was not the least doubt or sign of the smallest inflammation, corruption, erosion or sideration. There was no corrupt matter to indicate such an illness. The Ichor could not have been healthier, no wasted humor, nor was there anything at all extraordinary or any effect of poison.

3. Without defending myself, I did not think that a disease caused by an

ulcer was in that part of the stomach which was lacerated and that it had eaten up the membranes of the esophagus as well as the pleura. I do not doubt that many Doctors are of this opinion, nor can it be said that we preferred to suspect such than to believe the less possible when we thought the ruptured fistula was healthy and was without injury: especially since there was no neighboring or adjoining part to lead us to believe that it was ruptured. Medical science verifies this by autopsies. Frequently ulcers in the stomach or intestines are described. But membranes wasted by ulcers and almost destroyed are not considered causes of death. This led us to wonder why the Most Noble Man tried to relieve himself by frequent vomiting when we recalled that he often complained of a pain which he felt most at the opening of the stomach, and which he considered the main cause. We would not have agreed to this. Whoever reads this understands well that we could not delay or be negligent. But the more we accurately or clearly gaze upon this wound and its surrounding areas, the more evidently everything dissuades us from agreeing with this idea. For when we examined and felt everything there was not seen any ulcerous swelling anywhere on the side; nor was there any indication to the eye or hand of any ulcer, fungus, or swelling, any lump, or any swollen, humid, spongy, infected labia, any sinuous cavities, no winding fistulas, injured parts, nothing. On the contrary everything everywhere had a healthy appearance even with a recent rupture of the parts in which, however, there were no ulcers, decay, consumption, or gangrene. Do not spend too much time with the swollen area of the emphysematous membrane in the wound I mentioned before and which I said was present: since careful examination proved that this was due to the humor which was forced there after the rupture of the stomach and which worked itself under the entire pleura into the easily extendable and fine spaces of this area: when the area was pressed it gave off the same humor which was in the stomach and in the thorax. You might think that the black color in the injured area was an indication of gangrene. I thought so at the beginning and the wound at first seemed to uphold my suspicion. But I quickly changed my mind when I saw there was no sign of gangrene, consumption, or deadly odor; and that the black liquid was what remained of the Carduus and the Danzig beer he had drunk and which had penetrated the area. Even at his last meal there was not the least complaint heard of any ill feeling which would have quickly and easily hindered his deglutition. But so many people have a heavy pain in the stomach which is frequent and usual that it was hardly considered of any importance. He complained of a slight pain of compression, but never complained of its severity.

4. There remains nothing but for us to ascribe the nature of the illness and its cause to a recent dilaceration of the part. It seems credible since he had drunk seven full cups of Carduus Benedictus and then vomited up a little that the stomach was at this time sufficiently stretched and it had admitted

nothing through the constricted pylorus. The more it became filled and swollen the more difficulty it had to unburden itself. There was always swelling below and in the cavity and it completely prevented any effort on the part of the diaphragm to which it is joined or on the part of the stomach into which it empties its contents. The sick man tried and employed his best efforts at vomiting by drinking much water but they were futile. At the brave effort made after the walls were torn on the inside, he became tense from the swelling stomach and sticking his finger into his throat the passage became irritated and his stomach seemed lacerated. At this attempt he gave a great cry and said that something internal was ruptured, though he did not feel this before. It was not completely true that the tube ruptured then but by continual tension of the filled stomach by the movement of the diaphragm, by the irritation of the palate, and by the contraction of the entrails, the wound from the attack became larger and larger, more torn and finally worse ruptured. Meanwhile when he was without medical advice he drank four ounces of olive oil and irritated his palate again, with intolerable pain, great effort, and with great force vomited some of the oil and *Carduus Benedictus*. He drank some more and retained it without becoming further nauseated. Then he drank five ounces of Danish beer, veal broth freely, and other things we mentioned: many liquids, and retained these with hardly any urine. The stomach seemed to pass liquids through its upper opening and other contents which were carried by way of the wound to the emphysematous area. I shudder when I think of it: and then both pleurae tore and thus by this entrance, everything entered both cavities of the thorax together with the air which is always present here and with whatever air deglutition brought and left there. That this was true is proven from the small amount of urine, no vomiting, the space of the stomach filled with nothing but air, the abundance of food eaten, everything found in the chest along with the odor and color of the food he had eaten, which before the dilaceration of the esophagus had gone straight to the cavity of the stomach. Hence it is clear that in this robust fifty year old man his lacerated membranes, his every nerve, and his sharp sensations brought on terrible pain which never remitted but always grew worse. Hence we can understand that when the warm, rarefied, and condensed air was admitted into the spacious and fine labyrinth, it came to the subcutaneous areas which we have described and inflated them up to the point of emphysema; when the return of blood from the arteries through the compressed veins was hindered, black and blue marks appeared on both sides. Hence it is certain that all this could not have caused death before the air was carried in such great quantity from the stomach and gullet into both repositories of the lungs so that these could not spread out, for then the impeding of the respiration caused death.

5. I think I can rightly state that once the malady was present and known as present by certain indications there was no medical remedy or any hope,

for deglutition is necessary to moisten the fauces and its adjoining areas; all the humor swallowed, however, could not enter the stomach and found its way through the wound in the esophagus into the thorax. But since no liquid was brought here, nevertheless the air which was carried down will enter the thoracic cavity through this entrance, quickly filling it and suffocating it. If any food or drink or any remedies are offered to the sufferer everything will take the same course into the open thorax and necessarily will accumulate and deposit there. If a person would take nothing, how would he sustain life? But if he used great moderation as this man did in everything he took, how long will this sustain him? Though he exhausts himself with hunger and the dry body is eaten up with burning thirst, he is very miserable. Exhausted by a thousand intolerable torments of inevitable pain he will endure only for a few days and only to suffer more and worse pain. A thousand times will he ask for an early death to relieve him.

Let not anyone insanely suggest that the right intercostal regions should be perforated by the Surgeon. Nor let it be said that the humors in the thoracic cavity could be emptied. It will be said, I know, that nature often discharges dangerous ballast and thereby cheats the threats of death, more frequently in hydrops of the chest and often in empyemata whenever it is aided with paracenteses. Whoever urges that a deadly malady be so subdued shows an inept and ridiculous lack of knowledge by making such a comparison. Let him consider reality and he will soon see how false is his notion and how dangerous and venturesome is his suggestion. If air gains entrance by a wound on the right side, it will immediately rush into the thoracic cavity and will compress the lung so that it will soon be impossible to breathe; if a perforation would be made on the other side, the air which entered through the wound would compress this lung so that in a matter of seconds, Doctors say, the person would suffocate. Medical science forbids this and teaches rather that rashness is a vice; we did not follow this counsel because it would have been fatal. We can say no more. If I grant then, which no one will grant, that the liquids could be safely emptied from the chest with paracentesis, the Doctor will yet be of no benefit to the patient even with this, unless with superhuman power he finds a means to prolong the man's life without any necessity or use for further deglutition. His genius would be Promethean to associate the parts, to form again the bodies of men!

I prudently collected the results of all this analysis: *when the disease I described occurred we could not diagnose it by its symptoms, but if it had been recognized it would have ignored every remedy. When it recurs again it can be recognized with the help of this description, but cannot be remedied by any assistance of the medical profession.*

Our particular thanks are due the erudite Professor Joseph A. Ewan of the Department of Botany, of Tulane University, whose knowledge of Historical Botany greatly facilitated our steps in what would otherwise have been *terra incognita*.

## NOTES

1. An idea of the scope of this remarkable man's activity may be had from the full title of the biography written by William Burton, one of his numerous graduate students. "An Account of the Life and Writings of Herman Boerhaave, Doctor of Philosophy and Medicine; Professor of the Theory and Practice of Physic; and also of Botany and Chemistry in the University of Leyden; President of the Chirurgical College in that City; Fellow of the Royal Society in London, and of the Royal Academy at Paris. In Two Parts. The Second Edition. London 1746. Printed for Henry Lintot." By all accounts Boerhaave was the leading physician of his time; his fame was such that a letter addressed to "Dr. Boerhaave, Physician in Europe" was delivered without delay.

2. Menno Hertzberger: *Short-title Catalogue of Books Written and Edited by Herman Boerhaave*, (Amsterdam, The Author, 1927) records three editions, all published at Leyden (1724, 1740 and again 1740) besides an edition of 1771 (Frankfurt and Leipzig).

3. Mr. J. A. Kooij, The Chancellor of the Consulate-General of the Netherlands at New Orleans, Louisiana, informs us that the distinguished van Wassenae family is still prominent in the Netherlands.

4. Modern Rijnland.

5. Ipecacuanha, the Portuguese form of the native word i-pe-kaa-guéne, which is said to mean "road-side sick-making plant." According to F. W. Pennell in *Frans Verdoorn's Plants and Plant Science in Latin America* (Waltham, Massachusetts, Chronica Botanica, 1945): "commencing in 1637 the Dutch Willem Piso made observations of medicinal plants in the easternmost part of South America (from the states of Ceará and Rio Grande do Norte to Sergipe, Brazil). . . ."

An earlier edition was published by Piso in 1648; but the copy in the Tulane Howard-Tilton Memorial Library is dated 1658 (*De Indiae Utriusque Re Naturali et Medica. Libri Quatuordecim. Amstelædami, apud Ludovicum et Danielem Elzeviros*). The use of ipecac is discussed in caput IX, p. 37 *De Ventris Fluxibus* and in caput XII, p. 39-40, *De Dysenteria*.

6. *Carduus benedictus* (*Cnicus benedictus* L.), holy thistle, "said to have derived its name from its high reputation as a cure-all . . ." (M. Grieve and C. F. Leyel, *A Modern Herbal*, New York. Harcourt, Brace, 1931, vol. 2, p. 795.) In Shakespeare's *Much Ado About Nothing*, Act III, Scene IV, Margaret says: "Get you some of this distilled *Carduus Benedictus* and lay it to your heart: it is the only thing for a qualm. . . . I meant plain holy thistle." In P. Fournier's *Le Livre des Plantes Médicinales et Vénéneuses de France*, Paris, Lechevalier, 1947, we read: "D'après Pline, ce chardon, aimé des anes, leur procure des flatuosités sonores qui lui ont fait donner le nom d'onopordon, du grec *ὄνος* ane et *πορδή* pet."

7. Given as "wash basin or slop jar" by Dr. F. P. H. Prick van Wely in Kramer's *Frans Woordenboek*. Den Haag, Batavia, G. B. van Goor Zonen's Uitgeversmaatschappij N. V., 1949.

8. Joopenbier, i.e., spruce beer. "The well-known 'Danzig-spruce' is prepared by adding a decoction of the buds or cones to the wort . . . before fermentation. Similar preparations are in use wherever the spruce fir abounds." (*Encyc. Brit.*, 11th ed. vol. 10, p. 395, 1911). *The Century Dictionary and Cyclopædia*, vol. 9, p. 5867, 5868, New York, Century, 1913, defines spruce-beer as follows: "Spruce < M E Spruce, a variant with unoriginal initial S-, of Pruce, Prus, Pruys (also in comp. Pruslond, Pruyslond), < O F Pruce (F. Prusse), <

M L Prussia (G. Preussen = D. Pruissen = Sw. Dan. Preussen) Prussia + beer or an accommodation and translation of G. Sprossenbier, lit. 'sprouts-beer' obtained from the young sprouts of the black spruce-fir." A formula for its preparation is given in Henley's *Twentieth Century Formulas, Recipes, and Processes*. New York, The Norman W. Henley Publishing Co., 1927, p. 119.

9. Ptisan, a farinaceous drink, a decoction.

10. Scorzonera, a large genus of herbs of the chicory family.

11. Sisarum, according to A. P. de Candolle, *Prodromus Systematis Naturalis Regni Vegetabilis sive enumeratio contracta ordinum, generum, specierumque, plantarum hucusque cognitarum*. Parisiis, Sumptibus Sociorum Treuttel et Wurtz, 1830, is Sium Koch; he adds, "S. Sisarum (Linn. spec. 361). . . à tempore indefinito in Europâ cultum." The long medical use of this is noted in Caspari Bauhini, *IIINAΣ Theatri Botanici sive index in Theophrastus Dioscoridis, Plinii et botanicorum qui a seculo scripserunt opera plantarum circiter sex millium ab ipsis exhibitarum nomina cum earundem Synonymijs & differentiis methodice*. Opus xl annorum. Basileae, Impensis Joannis Regis, 1671. "Diosc. 1.2 c. 139. vulgo cognitum, cujus radix elixa, origrata, est. Siser Plinio 1. 19. c. 5 quod olim in Germania cibi causa serebatur, quare eam quot annis a Germanis Tib. Caesar, Plinio scribente, flagitavit." In the British Herbal of 1756, p. 424, Sisarum vulgare is given as the common skirret, "a native of Spain . . . cultivated in other countries for the root, which is pleasant and wholesome." Webster's New International Dictionary of the English Language, 2nd ed. unabridged, vol. 2, p. 2356, Springfield, Mass., Merriam Co., 1951, gives: "Skirret [M E *skirwhit* (after M E. *skir* pure *whit* white) fr. O F. *eschervi* (F. *chervis*), fr. Ar. *karawya*]. An Asiatic herb (*Sium sisarium*) cultivated in Europe for its sweet, edible, tuberous roots."

12. Verbascum, a large genus of coarse, widely distributed herbs, the mulleins.

13. Jean Francois Fernel (1497-1558), the outstanding French physician, as Ambroise Paré (1510-1590) was the outstanding French surgeon of the sixteenth century. The formula is given in Fernelii, Io. Ambiani, *Therapetices universalis, seu medendi rationis*, Libri septem. Hanoviae, Typis Wechelianis apud Claudium, 1607. Liber VII, p. 351. "Syrupvs althaeae crassam obstruentemque renum pituitam et lentam purulentamq; eorum saniem et arenulas blande ac clementer expurgat citra manifestum calorem, vrinæ praeterea demulcet ardorem. ʒi radicum althaeae ʒij cicerum rubrorum ʒj radicum graminis et asparagi, glycyrrhizae mundatae, vuarum passarum expurgatarum an. ʒ ss. cymarum althaeae, maluae, helxines, pimpinellae, plantaginis, adianti vtriusque an.m.j. quatuor seminum frigidorum maiorum et minorum an. ʒiii. coquantur ex aequae lib.vj. dum quatuor supersint, cum sacchari albi lib. iiij. percoquatur syrupus." A contemporary translation follows: "Les sept livres de la Therapeutique universelle de Messire Jean Fernel Premier médecin de Henry II et Docteur Regent de la Faculté de Paris. Mis en François par le sieur du Teil à Paris Chez la Veufue Jean le Bouc 1648. Liure VII, p. 594-595. Prenez racines de guimauve deux onces, pois rouges une once, racines de dent de chien, et d'asperge, reglisse mondée, raisins secs mondez de chacun demie-once, pointes de guimauve, parietaire, pimprenelle, plantain, l'un et l'autre adiantum, de chacun une poignée, quatre grandes semences froides et petites, de chacune trois onces, faites les bouillir dans six liures d'eau tant qu'il n'en reste que quatre, que le syrop soit acheué de cuire avec quatre liures de sucre blanc."

14. Frederik Ruysch (1638-1731), anatomist.

15. Cotyla or cotula, a cup or vase of medium size.

16. In Amsterdam measure one ounce equals 100 grams or cubic centimeters.